National Institute of Environmental Health Sciences

Episodes of atrial fibrillation and meteorological conditions

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Abstract:

BACKGROUND: Atrial fibrillation (AF) is the most common arrhythmia encountered in clinical practice. The natural history of AF tends to begin with short paroxysms which gradually evolve into longer episodes, frequently treatment-resistant, and finally take a permanent form. It is a polyaetiological condition and single paroxysms may be caused by a variety of factors. There is a prevailing belief that weather is a vital element affecting the functioning of the human organism. Accordingly, high variability in hospital admissions due to AF paroxysms may be associated with meteorological conditions. AIM: To investigate the relationship between the incidence of AF paroxysms and atmospheric phenomena. METHODS: A total of 739 patients participated in the study [52% females, aged 18-91 (meanEuro Surveillance (Bulletin Europeen Sur Les Maladies Transmissibles; European Communicable Disease Bulletin)65 years)], hospitalised for AF paroxysms in the Cardiac Care Unit (CCU) in 2005-2006. Patients with AF secondary to acute coronary syndrome, recent myocardial infarction, myocarditis, pericarditis, thyrotoxicosis, and disorders of the respiratory system, were excluded from the analysis. Statistical relationships were sought between the frequency of AF paroxysms and meteorological elements, such as: temperature change, atmospheric pressure, relative humidity, cloudiness, and wind speed. Using synoptic maps, such phenomena as weather fronts occurrence and baric systems were analysed. RESULTS: A considerable influence of a cold front and occlusion of cold front type on increases in admissions to CCU for AF paroxysms was observed. The absence of arrhythmia for many consecutive days was noted during the presence of stationary high-pressure areas. There were no significant relationships between meteorological elements and AF paroxysms. A seasonal distribution of AF episodes was found, with the maximum incidence in winter months and a decrease in the number of patients hospitalised from May to August. The impact of cold fronts may be explained by the effect of electromagnetic waves occurring in the zone of atmospheric changes, which may penetrate into buildings. On account of the translocation speed of electromagnetic waves, the effects may be felt many hours before an atmospheric front approaches. CONCLUSIONS: Meteorological conditions may have some influence on the occurrence of paroxysms of atrial fibrillation. This study could serve as a starting point for further research investigating relationships between weather conditions and heart rhythm disorders.

Source: Ask your librarian to help locate this item.

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Meteorological Factors, Meteorological Factors, Meteorological Factors, Temperature, Other Exposure

Other Exposure: Cloudiness

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Poland

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Cardiovascular Effect

Cardiovascular Effect: Other Cardiovascular Effect

Cardiovascular Disease (other): Atrial fibrillation

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Elderly

Other Vulnerable Population: People with concomitant ischaemic heart disease or arterial hypertension

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content